

# Wikis are good for knowlegde management\*

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## Abstract

Wikis provide a new way of collaboration and knowledge sharing. Wikis are software that allows users to work collectively on a web-based knowledge base. Wikis are characterised by a sense of anarchism, collaboration, connectivity, organic development and self-healing, and they rely on trust. We list several concerns about applying wikis in professional organisation. After these concerns are met, wikis can provide a progressive, new knowledge sharing and collabora- tion tool.

## 1 Grassroots knowledge sharing

During the last decades, the sharing of information and knowledge has gone through an unheard rapidisation. Both the amount of information shared, as well as the speed in which this happens, has taken a huge flight. In many fields of progress, professional organisations were more ad- vanced than amateur knowledge sharers. Remarkably, in some fields this has changed over the years. On the Internet, many succesful grassroots initiatives have popped up, that still didnt make it to the somewhat static and controlled environment of professional business organisa- tions. Think of free-software projects, but also of free-information projects, as wikis, weblogs, and open news sites like Indymedia. (Möller, 2005)

In this paper, we will examine on of the most popular and upcoming knowledge sharing enablers on the Internet: wikis. Consequently, we will discuss why wikis are not (yet) adequate for a professional environment, and what could be changed to have companies adapt the power of wiki-based knowledge sharing too.

## 2 Wikis

Möller (2005)[page vii, translated] defines wikis as open websites that can be edited by every visitor.<sup>1</sup> We will extend this definition in two ways: (1) we explicitly state that modifying can also include deleting information, and (2) we mention the fact that a wiki is in fact a knowledge base. Hence, we come up with the following defition of a wiki:

a piece of software that allows users to add, modify, and/or delete informa-  
tion from a knowledge base via the web

The exact functionality of the wiki differs per software package – the so-called wiki engine – and the configuration of the engine. For instance, some wikis allow every anonymous visitor to alter the information, where as others only allow registered users to do this. Some engines allow multimedia uploads (like images or sound files), where others have functionality to prevent ‘edit conflicts’.

\*This position paper was written in 2005. It has never been published apart from arXiv.org.

<sup>1</sup>The original definition is: offene Websites, die jeder Besucher bearbeiten kann.

Wikis are invented by Ward Cunningham, and elaborated upon by Leuf and Cunningham (2001).

## 2.1 Characteristics

We can distinguish six prominent characteristics of wikis. Wikis are by nature (1) anarchistic, (2) collaborative, (3) connected, (4) organic, (5) self-healing, (6) based on trust.

### Anarchistic

Wikis are anarchistic in the sense that there is no power structure. In general, no user has more rights than any other user. On many wikis, anonymous users have the same rights as registered users. Sometimes some power structure is established. For instance, on Wikipedia there are sysops (system operators) that have additional functionality for the reversion of vandalism. Because of the anarchistic nature, a power structure can lead to conflicts between users, e.g., when assigning new sysops.

Because of the equality of rights, there is also no division of labour. There is no director that tells subordinates what to do. Each individual can select the role that best fits his or her preferences.

### Collaborative

A wiki is for the most part a collaboration tool. The users work together to create a certain end-product, whether that be a report, a reference guide, or an encyclopedia. Its strength is in its ability to facilitate users to cooperate without a division of labour has been made in advance. With support for so-called 'edit conflicts' users can even work on the same page on the same time.

A wiki is less good at supporting communication between users. Many wikis also contain discussion pages, but for elaborate discussions other tools, like e-mail or web-based forums, provide better functionality.

### Connected

The pages in a wiki generally are not ordered in a prescribed way, like in a book. Just like on the World Wide Web, wikipages are interlinked in a network structure. Organising knowledge in a network instead of a sequence appears to be a natural way of knowledge representation, as also knowledge in books on its turn can be seen as networked knowledge. Or as Foucault (1972)[p. 23] puts it: The frontiers of a book are never clear-cut: beyond the title, the first lines, and the last full stop, beyond its internal configuration and its autonomous form, it is caught up in a system of references to other books, other texts, other sentences: it is a node within a network.

Creating links in a wiki is generally very easy: applying the linking syntax to a certain term, usually putting it between brackets or writing it in camel case<sup>2</sup>, immediately creates a link to a wikipage which has that term as a title.

### Organic

Because of the lack of control and delegated division of labour, a wiki expands itself in an organic way. Information on one subject can be very detailed, whereas other equally important subjects might get not elaborated upon. The direction in which a wiki expands depends largely on its community, with all its – perhaps uncommon – interests, hypes and trends. For instance, the Dutch Wikipedia has an very active user

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<sup>2</sup>The early wikis used camel case for linking. Camel case is glueing words together and replacing spaces by a capital-ization of the next character. Examples of this are camelCase (lower camel case, starting with a lower case character) and WikiWikiWeb (upper camel case, starting with a capital). Text and titles with camel case terms might look odd to the average reader, and some claim the success of modern wikis is partly because of the abandoning of camel case.

living in Thailand. For this reason, the information on Thailand in the Dutch Wikipedia is unproportionally large, compared to, e.g., the African countries.

### **Self-healing**

Wikis are sensitive to vandalism: malicious users deleting information or inserting incorrect information. Especially wikis that allow unregistered users to make changes encounter this problem. However, a wiki, especially wikis with a large community, have a high potential of self-healing. The famous citation by Raymond (1997) on open-source software development, “Given enough eyes, all bugs are shallow”,<sup>3</sup> applies to wikis too. As a lot of people read the pages, if the community is large enough amongst them might be experts in the fields, vandalism and incorrect information are likely to be corrected in a fair amount of time.

Generally in the large Wikipedias, reverting obvious vandalisms is a matter of seconds to minutes. The real problem however lies with incorrect information that looks plausible or is generally believed to be plausible. Wikis might be sensitive to hoaxes and urban myths. However, the German Wikipedia shows to outperform the more established Encarta and Brockhaus, even concerning content quality (Kurzidem, 2004).

### **Based on trust**

Wikicommunities heavily on the trust between its users. Since it is so easy to revert changes, conflicts can quickly result in ‘edit wars’ where multiple users keep on reverting each others changes because they don’t agree. And because of the anarchistic character, there is no arbitrator to make a final decision. Of course they community can create a consensus, e.g., by voting, but there is no way to enforce the result of the consensus upon the users in conflict.

## **2.2 Advantages**

From the characteristics in the previous subsection, we can tell that wikis have several advantages over other collaboration tools. Wikis allow users to work on the same document, or the same part of the document, at the same time. And users can at any time consult the latest version of the document, without the editors having to send out copies of the new version.

Another important advantage is that it takes away the role of editor, or rather: it makes everyone an editor. It is quicker and easier to do than any other publish method, and hence it expands quicker and is more up to date. And in most cases, its self-healing capabilities function well enough to remove or correct the junk that gets uploaded.

Each user can, within certain limitations, select his/her own role. This means that users get more satisfaction out of their work and can be more motivated. Also, giving users certain freedom stimulates the creative process, which can result in unexpected new findings. Hypothetically, this creative process can even transcend organisational boundaries, so that people from different departments can work on documents or concepts that turn out to be relevant to both departments.

## **2.3 Successful examples**

On the Internet, there exist several successful wikis. The most well-known and undoubtedly most successful example is Wikipedia, a descendant of the Nupedia project.<sup>4</sup> Wikipedia is an effort to create an open encyclopedia in several languages by means of wiki software, started by Jimmy Wales. The content of the encyclopedia is available to users under the GNU Free Documentation License. The English language Wikipedia –

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<sup>3</sup>Raymond calls this Linuss Law.

<sup>4</sup>Nupedia was a project to create an open-content encyclopedia with a peer-review system. Its main editor, Larry Sanger, resigned in 2002, and in 2003 the website went down.

with over 440.000 articles<sup>5</sup> – is larger than the Encyclopædia Britannica – with 120.000 articles in the on-line version, the biggest edition.<sup>6</sup>

Wikipedia uses the MediaWiki software. There are several Wikipedia-related projects that also use this wiki engine, such as Wiktionary (dictionary), WikiBooks (textbooks and manuals), WikiQuote, WikiSource (previously published documents) and Wiki-News.

Other well-known wikis include are the MeatBallWiki (about on-line culture and communities), the LinuxWiki, WikiTravel (a travel guide), and the SwitchWiki, which aims to be a list of all available wikis around the globe.

### 3 Applying Wikis in Organisations

All successful examples of wiki implementations mentioned in section 2.3 are freely available on the Internet, and its user community consists completely of volunteers. Wikis are now gaining attention in professional organisation, and companies like Socialtext and JotSpot now provide wiki services to companies (see section 4). The application of wikis in business might provide a new way of knowledge sharing and might connect people with similar interest that are organisationally dispersed. However, before implementing the software straight away in a business environment, we see a few points of attention. We will discuss them in four groups: (1) motivational considerations, (2) authoritan considerations, (3) strategic considerations, and (4) effectivity considerations

#### 3.1 Motivational concerns

The volunteers that fill the wikis on the Internet do not gain much by doing so. The users might add their knowledge because they expect to get other knowledge in return.<sup>7</sup> The volunteers that edit and add knowledge, often also use the wiki for their own reference. However, when a wiki grows large enough, we can see a ‘prisoner’s dilemma’<sup>8</sup> developing: one user’s contributions do not make a significant difference to the size or quality of the wiki. Therefore, the benefits are available anyhow, whether the user makes an effort to add more knowledge or not.<sup>9</sup> This situation resembles well-known economic examples of prisoner’s dilemmas, e.g., an inhabitant not donating voluntary money to its country’s security system, because the total outcome of the money collection will not be significantly affected by the individual’s decision whether or not to donate, and therefore the individual’s expected benefits are the same in any case.

An elucidation of the contributor’s motivation of large wikis should therefore be sought in other areas. Users can feel good sharing knowledge that other people might need – a philanthropic motivation –, they might enjoy taking credit for their well-written articles, or they might enjoy being a member of a certain community. Some Wikipedia contributors maintain a list of articles they’ve worked on, and frequently well-written articles are honoured, e.g., by a writing contest or by announcing them on the main page of the wiki. These are clues that might indicate the second option. Indications of the third options are the lively communities existing on many wiki, including non-wiki-related chats<sup>10</sup>, and real-life meetings.

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<sup>5</sup>Last checked on the 4th of January, 2005.

<sup>6</sup>According to [http://en.wikipedia.org/wiki/Encyclopædia\\_Britannica](http://en.wikipedia.org/wiki/Encyclopædia_Britannica).

<sup>7</sup>Please note that this section is highly speculative. Without proper research one cannot claim anything about the motives of strangers. Pitfalls, like ‘projection’ – the ascription of the authors own motives to the members of the wiki community –, are lurking.

<sup>8</sup>A prisoner’s dilemma is a situation in which the best rational decision for single individuals turns out to result in a suboptimal result for the group. This best rational strategy can be a so-called ‘dominant strategy’, a strategy that is best whatever the other player does. (Douma and Schreuder, 1998, p. 76-77)

<sup>9</sup>In smaller wikis this symptom might not appear, because a user feels he or she makes a significant contribution to the wiki. And when a wiki grows, more users might feel attracted to it and start to share too. Thus, on a small wiki a user might feel the contributions are beneficial for gaining own knowledge.

<sup>10</sup>Some wikis even have a designated area for off-topic chats, like the *Village pump* on the English Wikipedia, and *De kroeg* (the pub) on the Dutch Wikipedia.

In a professional environment, these motivations might change. A career holds a high priority to people in most modern societies, and many professionals maintain a competitive attitude towards co-workers. Knowledge is power, and this yields no place for philanthropic attitudes. An encyclopedia as Wikipedia contains mainly basic knowledge in expert fields, and general practitioners and legal experts that in their free time share this basic knowledge on Wikipedia will not lose much power. In a professional organisation, the knowledge to be shared is more focussed and therefore more inclined to go in-depth, resulting in a higher power-loss risk.

Professional organisations that want their knowledge base (their wiki) filled with the knowledge that lives within the organisation have two main options. First, they can stimulate or reinforce their employees to add knowledge to the wiki. This can, for instance, be done by setting periodic quota that employees have to meet, or to reward qualitative or quantitative contributions made by employees. These measures tend to stimulate quantity over quality, so management should well think through the implications of the measures they enforce. The second option is the dissolution of the prisoner's dilemma as much as possible. This can, for instance, be done by clustering a large wiki, or by setting special fields of attention. In this way, the user becomes more aware of certain interesting areas in the wiki, by which useful contributions from co-workers become more visible. Also, this might improve the community-feeling in certain parts of the wiki.

### **3.2 Authoritarian concerns**

Organisations are generally built around a certain authoritarian model, where certain people (usually managers) have responsibility for subparts of the organisation, or the organisation as a whole in the case of top management, and delegate tasks to subordinates. During the years the models of organisations have changed, going from hierarchical pyramids via networked organisation with high employee autonomy back to a sort of hierarchical diamond. However, the concepts of responsibility and delegating tasks have always been in place.

As discussed in subsection 2.1, wikis are anarchistic by nature. In a pure wiki, there are no users with a higher authority than others, and each individual picks its own tasks.<sup>11</sup> This might conflict with the labour divisions that already have been established within an organisation. Managers are not likely to give up their possibilities of delegating tasks, and moreover, in discussions regarding content people might use their position in the organisation as an argument, thereby overruling 'real' arguments.

### **3.3 Strategic concerns**

Organisations usually like to have control of the direction in which they are developing. For this reason, it creates a mission statement, a strategy, and goals. (Daft, 1998, p.40-44) A wiki, on the contrary, develops in an organic way. Since there generally is no authority, developments cannot be affected in a top-down fashion. However, sometimes bottom-up developments can steer the information expansion, e.g., by organising a 'theme week' in which contributors are stimulated to focus their attention on a (yet undervalued) topic. For wikis to become useful in organisations, more control over the knowledge expansion is needed.

### **3.4 Effectivity concerns**

One concern of large organisation is division in departments and units. This division is needed to keep the organisation manageable, but at the same time it creates barriers between people that might work in related areas, and the organisation would benefit from knowledge sharing between those people. The trend of organisations adopting

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<sup>11</sup>However, there might be peer pressure to perform additional tasks. For instance, contributors can be encouraged by fellow contributors to pay more attention to their spelling errors, or to add keywords for classification to their new articles. However, these requests have to be made in a friendly and co-operative way since there are no methods of enforcement.

‘people finder’ applications, that allow employees to search for other people based on their areas of expertise, reflect this need. Wikis might also break down these barriers. When several people of different departments work on a specific set of pages related to their area of work, they will get to know each other and each other’s expertises. However, it is still a question whether a wiki can break down these barriers, or that the organisational boundaries will also create matching clusters of pages without much connections between the clusters.

## 4 Overview of wikis in an professional environment

Wikis are getting more and more noticed by the professional world, as we can tell from the appearance of management articles about wikis, like Rand (2004) and Sharma (2004), and the note about wikis in Gartners Hype cycle for emerging technologies (Bradshaw, 2004). Several companies offer commercial services that, to some extend, resemble wikis. Social- Text<sup>12</sup> offers a software package which provides a simple wiki interface. Users can post notes, in a log style, and integrate this with their e-mail. It is aimed at unstructured, ad hoc collaboration, and can therefore be positioned somewhere between wikis and collaborative weblogs. In general, wikis are more structured and persistent than SocialText. A competing company called JobSpot<sup>13</sup> provides an easy interface, with WYSIWYG editor, to access a relational database that keeps contact information of clients and maintains a calendar. Other database applications can be created. JobSpot focusses more on storing data, than on creating documents. Netomat<sup>14</sup> offers multimedia whiteboards for real-time collaboration. Users can collaborate using many types of multimedia, but the knowledge isn’t stored in a manner that allows retrieval at a later point. All three commercial products have some flavour of wikis, but are not exactly it.

On the open-source side of wiki developments, a wiki engine called TWiki<sup>15</sup> is geared more towards a professional application than other wiki engines. For instance, it allows the creation of forms so that users can easily enter data that will be grouped on wiki pages. Also, the best known wiki engine, MediaWiki, is used by several companies, like Gartner and Novell.<sup>16</sup>

## 5 Conclusions

In this paper, we took a look at a new, original, and increasingly popular piece of collaboration software: wikis. They have a six prominent characteristics, namely anarchistic, collaborative, connected, organic, self-healing, and based on trust. Wikis provide new ways of working and can turn out to be beneficial to professional organisations. Several commercial services that have a wiki flavour already exist.

However, for wikis to become successful in professional organisations and to provide an added value in the organisations knowledge management, several modifications concerning the software and its surrounding policy have to be considered. We have elaborated upon motivational, authoritan, strategic, and effectivity concerns. For a wiki to be successful in professional organisations, these concerns have to be met by changes in the software or by attention and action of the management

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<sup>12</sup><http://www.socialtext.com>

<sup>13</sup><http://www.jobspot.com>

<sup>14</sup><http://www.netomat.net>

<sup>15</sup><http://www.twiki.org>

<sup>16</sup>According to [http://meta.wikimedia.org/wiki/Sites\\_using\\_MediaWiki](http://meta.wikimedia.org/wiki/Sites_using_MediaWiki).

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